MATHCOUNTS

1989-90
■ School Competition ■
Sprint Round

Name _____

**DO NOT BEGIN UNTIL YOU ARE
INSTRUCTED TO DO SO.**

This section of the contest consists of 30 questions. You will have 40 minutes to complete all the questions. Calculators, slide rules, books, or any other aids are not permitted to be used during the contests. Calculations may be done on scratch paper. All answers must be complete, legible, and simplified to lowest terms. Record only final answers in the blank on the right-hand column of the contest booklet. If you complete the questions before time is called, use the remaining time to check your answers.

Total Correct	Scorer's Initials

1. Max bought a new dirt bike and paid 10% down, which was $150. What was the price of the bike?

    1. _____

2. Solve for k. $2k + 5 = 13$

    2. _____

3. Simplify: $180 - 5 \cdot 2^2$

    3. _____

4. What fractional part of 72 is 16?

    4. _____

5. Round to the nearest hundredth: 18.4851

    5. _____

6. Solve for n: $.03n + .08(20 + n) = 12.6$

    6. _____

7. Evaluate: $3x^2 + 5x - 1$ if $x = 7$

    7. _____

8. Solve for r: $r = \dfrac{\sqrt{5^2 + 12^2}}{\sqrt{16} + 9}$
   Express as a common fraction.

    8. _____

9. If Heidi can paint a wall in 45 minutes, what fractional part of the wall can she paint in 9 minutes?

    9. _____

10. Express in simplest form: 50% of 60% of 10.

    10. _____

11. If Superman can fly 640 miles per hour, how many miles can he fly in 8 hours and 15 minutes?

    11. _____

12. The diagonal of a square is $3\sqrt{2}$. Find the perimeter.

    12. _____

13. If Wonder Woman can capture 6 criminals in an hour, how many can she capture in $4\frac{1}{2}$ hours?

    13. _____

14. The ratio of dogs to cats at the pound is 4:3. How many dogs were at the pound if a total of 280 dogs and cats were at the pound?

    14. _____

15. Solve for n: $\dfrac{n + 3}{5} = \dfrac{n}{8}$

    15. _____

16. Find the sum: $-39 + -37 + \ldots + -1$

    16. _____

17. Find the difference in simplest form:

$$\left(8\frac{2}{3} - 5\frac{1}{2} \right) - \left(6\frac{1}{3} - 3\frac{3}{4} \right)$$

17. _____

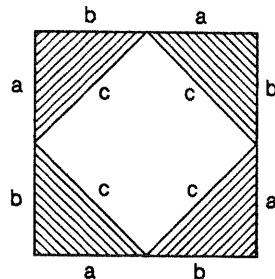18. Express as a common fraction in simplest form:

$$\sqrt{6\frac{1}{4}}$$

18. _____

19. Find $a + b$, if $b^a = 64$ and $a^b = 81$.

19. _____

20. If a, b, and c are consecutive integers, find the area of the shaded region in the square below:

20. _____

21. If $x = 2$ and $y = 3$, express the value of the following as a common fraction:

$$\frac{\dfrac{1}{y}}{\dfrac{1}{x}}$$

21. _____

22. A clock strikes once at 1:00, twice at 2:00, etc. How many times does the clock strike in a 24-hour period?

22. _____

23. A designer has 3 fabric colors he may use for a dress: red, green, and blue. Four different patterns are available for the dress. If each dress design requires one color and one pattern, how many different dress designs are possible?

23. _____

24. The areas of two squares are in the ratio 25:36. What is the ratio of their perimeters? Express your answer in the form a:b.

24. _____

25. A basketball player made the following number of free throws in 8 successive games: 6, 18, 15, 14, 19, 12, 19, and 15. What is the median number of successful free throws?

25. _____

26. Simplify: $\dfrac{4.8 \times 10^{-5}}{1.6 \times 10^{-7}}$

26. _____

27. Solve for p: $3p - 2(p - 4) = 7p + 6$

27. _____

28. The volume of a cube is 0.027 cubic meters. What is its surface area in square meters?

28. _____

29. Find the coordinates of the point halfway between the points (3,7) and (5,1).

29. _____

30. David's uncle loaned him $900 with no interest. David paid all of the money in equal monthly payments over 3 years. How much were the monthly payments?

30. _____